



MAGISTRATES COURT OF QUEENSLAND

**NEVILLE NAKATA,
Australian Fisheries Management Authority**

V

COLIN WARWICK SMYTH

FILE NO: MAG-00087729/08(7)

**PROCEEDING: COMPLAINT FOR FOUR BREACHES OF SECTION
95(1)(d) FISHERIES MANAGEMENT ACT 1991**

**CHARGES 1 AND 4 – FISHING IN A CLOSED AREA
CHARGES 2 AND 3 – FAIL TO ACCURATELY
RECORD LOCATION OF OPERATION IN LOG BOOK**

DELIVERED ON: 26 JUNE 2009

DELIVERED AT: CAIRNS MAGISTRATES COURT

MAGISTRATE: A.J.COMANS

**DECISION/ORDER: NOT GUILTY TO CHARGES 1 AND 4
GUILTY TO CHARGES 2 AND 3**

**PROCEEDINGS ADJOURNED TO A DATE TO BE
FIXED FOR SENTENCE ON CHARGES 2 AND 3,
FORMAL DISMISSAL OF CHARGES 1 AND 4 AND
HEARING ANY APPLICATIONS THAT ARISE FROM
THE DECISION**

Mr. Colin Smyth was a licensed fisherman with a fishing concession (a certificate of statutory fishing rights – ex 4) operating his own vessel, the Sherona, in the Northern Prawn Fishery in the waters around Weipa.

By direction, the government closes certain areas to persons with a fishing concession for certain periods as a fish management plan.

The law permits some crossing of the closed areas in certain circumstances.

The fishing concession imposes conditions on the holder, in this case Mr Smyth.

Mr Smyth has been charged with 4 breaches of the conditions of his fishing concession. Two of fishing inside a closed area and two of failing to comply with the general information and instructions for completion of the log book by not accurately recording the location of his operation.

CHARGE ONE	-	on 21/10/06 fishing in the closed area
CHARGE TWO	-	On 22/10/06 failing to accurately record the location of his operation
CHARGE THREE	-	on 2/11/06 – same as charge two
CHARGE FOUR	-	on 5/11/06 – same as charge one

The prosecution is brought under the Fisheries Management Act 1991, S95 (1) (d) and S95 (5), by an officer of the Australian Fisheries Management Authority (AFMA).

THE PROSECUTION'S FISHING CASE

The prosecution case is that Mr Smyth's vessel, the Sherona was detected by the Vessel Monitoring System (VMS) to be inside the closure area on the relevant dates, those dates being a time when the closure was in effect.

AFMA operates the VMS as a fisheries management tool.

The VMS consists of approved devices on board a vessel, in this case a TRIMBLE branded device. The device consists of a GPS component which receives transmissions from satellites and records the vessels position in latitude and longitude. The device then transmits that position (the polled position) by a data transfer through a system called INMARSAT to a land station, then onto the AFMA facility in Canberra where the data is processed and stored on a computer database.

The relevant data is the co-ordinates polled by the VMS and is accessed via printouts from the computer system (see ex 15).

By use of a computer software program, the area of the closure was recorded on an electronic map by an officer on AFMA, Mr Skousen.

The polled positions of the Sherona were then plotted by Mr Skousen on the same map using the same software.

The resultant maps then depict the Sherona's polled positions relative to the area of the closure on various dates.

The prosecution has not sought to prove the fishing case other than by reference to the maps produced by Mr Skousen from the VMS data.

In this case, the prosecution allege the Sherona was polled inside the closed area.

However that itself could not prove a case of fishing.

The time of the polled positions is also recorded by the VMS and by a process of connecting the dots (extrapolation) the prosecution allege the movement of the Sherona is depicted on the map.

The prosecution submits that movement represented on the map by the lines between the dots could only be by a vessel such as the Sherona, trawling for prawns.

Whilst that it is entirely circumstantial, there is also evidence of the logbook and by Mr Smyth himself, that on the relevant days he was in fact fishing.

What is in contention is, where was Mr Smyth fishing - inside or outside the closure.

THE PROSECUTION'S LOG BOOK CASE

The prosecution case is that on the relevant dates, Mr Smyth inaccurately recorded the location of his operation.

The basis for those two charges is that condition 23 of the Certificate of Statutory Fishing Rights (ex 4) required Mr Smyth to “ensure *that relevant information about fish taken and other species interactions....is accurately and fully recorded and submitted...in the log book....NP14 (see ex 2) in accordance with the general information and instructions for completion of the log book (see ex 1).*”

The requirement to complete the *location of operation* section is caught by the term in condition 23 *relevant information about fish taken*. In the context of recording information about fish taken, the location of where they are taken is clearly a relevant piece of information

The positions recorded by Mr Smyth in the logbook have been plotted onto the electronic maps by Mr Skousen and shown by a small grey square on exs 24 and 26. They are nowhere near where the Sherona was polled on those days and one is on land.

THE EVIDENCE

These are criminal prosecutions and the onus is on the prosecution to persuade the court that all elements of the offences have been proved beyond reasonable doubt.

They are offences of strict liability, that is there is no fault element for any of the physical elements, however the defence of mistake of fact is available.

If mistake is fairly raised on the evidence, the prosecution must negative it beyond reasonable doubt.

Evidence for the prosecution came from the following persons:

Mr Sandeman who is an officer of AFMA and produced documents including Mr Smyth's fishing concession, the direction 100 setting out the area of the Weipa closure and other documents relied on by the prosecution.

Mr Brand who is an expert user of the VMS system

Mr. Skousen who is an officer of AFMA and who produced the maps which the prosecution rely on to represent the polled positions of the Sherona in relation to the closure area and the position of the location of operation as recorded on the log book by Mr Smyth

Mr Galbraith who has knowledge and expertise in GPS

Mr Whitelaw who has knowledge of fishing practices and who was called to give opinion of whether the movement depicted on Mr Skousen's maps was consistent with the Sherona trawling for prawns.

Mr Smyth gave evidence for the defence, together with the instructing solicitor on a minor matter.

THE VESSEL MONITERING SYSTEM (VMS)

There was no evidence of a technical nature led about how the VMS works to prove that it does what it purports to do, i.e. poll the positions of vessels at particular times and record that information in a data base.

Mr Bland is an expert in the use of the VMS, not in how its works in a technical sense.

However, leaving accuracy aside for the moment, I have no doubt the VMS does what it purports to do in a general sense.

The prosecution have produced maps showing alleged polled positions on particular dates.

For example ex 32 – a map of the area around Groote Eylandt – Mr Smyth gave evidence he was steaming in that area at that time.

Also Mr Smyth has conducted his case in such a way that he does not draw back from the allegation that he was fishing near the closure line on 21/10/06 and 5/11/06, just that he was not fishing in the closure area as depicted in exs 20, 22 and 28, 30.

The issue for the court in the fishing charges is the accuracy of the positions plotted by Mr Skousen on exs 20,22, and 28, 30 from the data acquired from the VMS.

Those exhibits purport to show the Sherona trawling inside the closure line on 21/10/06 and 5/11/06

The accuracy of the VMS data has been shown to be effected in two ways in this case:

- The accuracy of the GPS component in the VMS
- The data of the coordinates recorded by the GPS component of the VMS is degraded to two decimal points and thereby incur an error margin of 67metres – this is a cost saving measure and a known error margin

The main issue is the accuracy of the position recording device - the GPS.

The prosecution in submissions at page 6 concedes that the accuracy of the VMS depends on the accuracy of the GPS in the unit.

The prosecution submit firstly that GPS are now regarded as notorious scientific instruments and judicial notice should be taken of their common use in everyday life.

(Ministry of Agriculture and Fisheries v Wallace [1998] DCR 837)

Alternatively, that the evidence of Mr Bland and Mr Galbraith and the surrounding circumstances of this case establish the accuracy of GPS.

In my view, the crux of this prosecution is not the accuracy of GPS generally, but the accuracy of the GPS attached to the Trimble VMS on board the Sherona on the relevant days.

There is no doubt that all GPS have a margin of error – that is evident from Mr Galbraith's evidence and Mr. Bland who explained the 67 metre error due to data degradation

As this is a criminal prosecution, Mr. Smyth is entitled to the benefit of the maximum degree of error.

This is a case where the allegations are that fishing occurred within parts of a nautical mile from the closure line.

It is therefore incumbent upon the prosecution to prove beyond a reasonable doubt:

- what the maximum degree of error of the GPS attached to the Trimble VMS on board the Sherona was at the relevant time; and
- the distances from the closure line to each of the polled positions where fishing is alleged to have taken place

It is not sufficient to simply look at the maps ex 20, 22 and 28, 30 and use the plotted positions to determine if Mr Smyth was inside the closure line.

The prosecution submits that taking into account the 67 metres for degradation of the data and Mr Galbraith's opinion that the current performance standard for GPS is 3 metres, that the error margin is plus or minus 70 metres.

I accept now that the error margin on account of degradation of the data is 67 metres.

ACCURACY OF THE GPS IN THE TRIMBLE VMS UNIT

The prosecution submit that the surrounding circumstances establish the accuracy of the GPS.

Those circumstances being:

- the dual polling of the Trimble and Thorne & Thorne units
- Mr Smyth acknowledging that he was either anchored or fishing in the areas shown on the maps

- Consistent positions from the data
- Mr Galbraith's evidence that if GPS not working properly it would not receive a signal

Firstly, I do not accept that the fact the Trimble and the Thrane & Thrane were polling the same or similarly when they were both operating at the same time on the Sherona assists the prosecution in proving the accuracy of the Trimble unit on the Sherona.

All that proves is they both have similar degrees of accuracy.

The rest of the circumstances prove only that GPS does in a general sense what it purports to do.

The maximum error margin cannot be determined from that evidence.

The case of *Chiou Yaou Fa v Morris (1987) 46NTR 1* is quite different to the circumstances of this prosecution.

That was a case before GPS was regarded as a notorious scientific instrument and the surrounding circumstances that proved the accuracy of the GPS was the evidence of two experienced naval navigators who independently to the GPS, plotted a ship's position.

In the case before this court there is no independent checking of the accuracy of the GPS involved.

Ministry of Agriculture and Fisheries v Wallace [1998] DCR 837 is a more recent case and GPS had developed considerably since 1987.

At page 8 of the report:

it followed that the stage had been reached where the community and the courts were so sufficiently familiar with GPS that proof of what it was and what it did would no longer be required although evidence of its accuracy at the relevant time might still be needed.

From a consideration of Mr Galbraith's evidence, I have formed the view that evidence of accuracy of the unit on board the Sherona is required in this case.

When asked if he could comment on the accuracy of the VMS data he replied:
that would depend on the GPS unit observing the data...also related to what unit and what method of return.

The method of return in this case is known to produce an error of 67 metres, but Mr Galbraith had no knowledge of the accuracy of the GPS in the Trimble VMS unit.

Not all GPS produce the same degree of accuracy.

The crucial issue is what is the maximum error margin for the GPS in the Trimble on board the Sherona.

In this regard, it was necessary to examine Mr. Galbraith's evidence closely.

Mr Galbraith gave evidence about what effects the accuracy of GPS.

Firstly accuracy depends on the number of satellites available at the particular time.

I accept that on the days fishing is alleged to have occurred in the closure, that conditions were very good for GPS operations.

Mr. Galbraith's opinion was:

In line with recent accuracy statements it would be less than 3 metres

However his evidence then raised many factors specific to a GPS unit itself that would affect accuracy.

I have distilled the following matters from Mr Galbraith's evidence that effect accuracy of a GPS unit:

- All GPS record and observe in WGS84 datum and that GPS units can be configured to display different datum – it is necessary to transform WGS84 data from the GPS to the datum relevant to the map/chart one is plotting onto – in this case Mr Skousen's electronic map was in AGD94 – according to Mr Galbraith it is a simple process in the software; but there is no evidence it was done
- Some commercial units (GPS) have correction sets for IONOSPHERIC delay and correct for time – no evidence of what the Trimble contains
- Ephemeris clocks – Mr Galbraith explained how the clocks fit into the scheme of GPS units

Depending on what sort of receiver you have as to how accurate that clock is

There is no evidence of that with regard the Trimble.

Mr Galbraith's evidence established that not all GPS units are the same.

In re-examination Mr Galbraith gave an error margin of plus or minus 73 metres.

However that is still a generalisation. It takes no account of:

- the type of unit
- its age (this unit is about 15 years old)

- does it have a correction set
- what datum is it in – is it in the usual WGS84
- is there a datum correction needed between the satellites and the GPS , then between the GPS and the software sending the data to AFMA
- was a correction necessary when transferring the coordinates from the computer to the AGD94 maps

These matters have potential to produce error in the final plotting by Mr Skousen on to the electronic maps (ex 20, 22 and 28, 30).

There is then the issue of Mr Skousen's evidence.

Mr Skousen took the data collected by the VMS and plotted it onto electronic maps to demonstrate in two dimensional form where the Sharona was polled relative to the closure line.

Up to that point, the evidence against Mr Smyth had been collected electronically with no human intervention.

Mr Skousen admitted to human error in respect to the initial production of the maps showing the closure – he failed to convert the description of the closure from Direction 100 from AGD66 to GDA94.

That error occurred in the map 36 (exs 33 and 34) and in the first version of the electronic maps (ex 21, 23 and 29, 31) and made those maps inaccurate.

Mr Skousen said he rectified that error and produced the version 2 maps (ex 20, 22 and 28, 30) which are the maps relied upon by the prosecution to show the Sherona's position relative to the closure line.

Mr. Skousen was cross-examined about the absence of reference co-ordinates on the borders of those maps – some had one reference on one side and others none. Mr Skousen confirmed that it was a mistake not to have the reference co ordinates showing.

That error was explained to be human error, in that when the map was zoomed the software was not adjusted so the reference co-ordinates would be shown.

However the result is that the court is entirely dependent on Mr Skousen's say so that the closure line has been plotted accurately and is depicted accurately on the maps, ex 20, 22 and 28, 30 (the version 2 maps).

No independent check of Mr Skousen's plotting has been made, either in or out of court.

This is a very concerning factor bearing in mind the errors/mistakes admitted to by Mr Skousen in the preparation of the maps as evidence in these proceedings.

Other factors giving concern are:

The Trimble was not installed according to the 11 point plan required by AFMA

Mr Bland did not know what software was in the Trimble in 2006 and the unit was some 13 years old

Mr Bland confirmed that when installed, VMS units are not checked for accuracy

The anomaly in Direction 100 with respect to the closure line extending to a point on the land at Thud Point in contradiction to the actual co-ordinate nominated.

MR SMYTH'S EVIDENCE

Mr Smyth gave evidence about inaccuracies in other GPS units on his vessel. However these errors seem to be constant and he would make adjustments accordingly. Rather than proving GPS is prone to wild inaccuracies, they are probably the product of human error, e.g. – making unnecessary corrections for datum differences.

I should say here that I accept Mr Smyth as an honest witness.

CONCLUSIONS

I have not undertaken an exercise of scientifically appraising GPS and found them to be inherently inaccurate.

This is a criminal prosecution where the evidence must persuade the court that the essential elements of the charges have been proved beyond a reasonable doubt.

Even though I accept that in a general sense GPS do what they purport to do, i.e. record their own position by reference to the satellite constellation, there is an acknowledged error margin to be considered.

The error margin for the GPS attached to the Trimble on board the Sherona has not been established and because of the number of factors that could effect the accuracy of a particular GPS, I find I cannot simply apply the general current standard referred to by Mr Galbraith.

I also find that due to the lack of any independent check on Mr Skousen's plotting exercise, that I cannot accept the maps (ex 20, 22 and 28, 20) as 100% reliable.

The fact that on 21 October 2006 ex 20 shows Mr Smyth's log book position a couple of nautical miles inside the closure line does not assist the prosecution; that position is nowhere near where he is alleged to be fishing and I could not exclude that is not another of Mr Smyth's careless log book recordings (see below).

Whilst Mr. Smyth's evidence that he has never fished in a closure is self serving, he is an experienced fisherman and skipper whom I have found to be an honest witness. His

evidence about his navigational habits and practices whilst fishing has contributed to the doubt raised in my mind about the accuracy of exs 20, 22 and 28, 20.

Upon a consideration of all the evidence, I am not persuaded beyond reasonable doubt that the Sherona was polled inside the closure as depicted on exs 20, 22 and 28, 20 on 21 October 2006 and 5 November 2006.

I find Mr Smyth not guilty of fishing inside the closure on 21 October 2006 and 5 November 2006.

THE LOG BOOK CHARGES.

Mr Smyth has acknowledged the errors made in the recordings in the log book for 22 October 2006 and 2 November 2006. Those positions put him on 22 October 2006 a few metres off the land and on 2 November 2006 on the land.

Mr Smyth says, in effect, he made a simple mistake of writing down the incorrect co-ordinates.

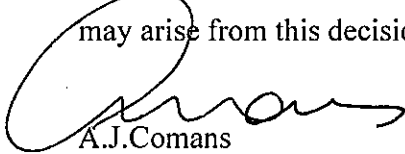
To be excused at law for such a mistake, it must be both honest and reasonable.

I have no doubt about Mr Smyth's honesty, but upon his own evidence, it is not a reasonable mistake to make. He said he recorded the log book positions at the end of the day without giving it much thought.

Being a professional fisherman involved in an obviously highly regulated industry, it is unreasonable not to give the collecting of this type of data full attention.

Mr. Smyth is found guilty of those of those two charges.

The proceedings are now adjourned to a date to be fixed for sentence on the two log book charges, formal dismissal of the two fishing charges and hearing of any applications that may arise from this decision.

A handwritten signature in black ink, appearing to read 'A.J. Comans', written over the end of the text above.

A.J. Comans

MAGISTRATE